

REMARKS

This Reply is in response to the Final Office Action mailed on October 18, 2005 in which Claim 12 was objected to and in which Claims 1-7, 9-11 and 13-20 were rejected. With this response, Claim 18 is cancelled and Claim 21 is added. Claims 1-17 and 19-21 are presented for reconsideration and allowance.

I. Examiner Interview Summary.

On December 15, 2005, a telephonic interview was held between Examiner Larkin and Applicant's attorney, Todd A. Rathe. The rejection of the claims based upon Jackson, U.S. Patent No. 5,934,140, and Watanabe, Japanese 63-62752 was discussed. During the interview, Examiner Larkin cited Gamble, U.S. Patent No. 5,681,987, describing an atomic force microscope. However, since the Examiner has not specifically asserted or relied upon Gamble in rejecting the present claims, Applicants have refrained from addressing Gamble at this particular time. Although no specific agreement was reached with regard to the claims, Applicant wishes to thank Examiner Larkin for the opportunity to discuss the rejections.

II. Rejection of Claims 1-7, 9-11 and 13-20 Under 35 U.S.C. § 103 Based Upon Jackson and Watanabe.

Paragraph 2 of the Office Action rejected Claims 1-7, 9-11 and 13-20 under 35 U.S.C. § 103 (a) as being unpatentable over Jackson et al., U.S. Patent No. 5,934,140, in view of Watanabe et al., JP 63-62752. Claim 18 is cancelled. Based on the remarks which follow, Applicant respectfully requests that the rejection of Claims 1-7, 9-11, 13-17 and 19-20 be withdrawn.

A. Claims 1, 6 and 15.

Claim 1 recites a printing device which includes a surface-engaging member, a reflective member joined to the surface-engaging member, one or more light sources configured to project light energy toward the reflective member and a position detector configured to receive light energy that is reflected from the reflective member. The surface-engaging member is configured for displacement by

the medium's surface in accordance with variations in roughness of the surface sufficiently so that light that is reflected by the reflective member and received by the position detector can be utilized to ascertain or measure the medium surface's roughness.

Claim 6 recites a method of detecting the roughness of a medium surface which includes engaging a medium surface with a surface-engaging member, projecting light energy towards a reflective member associated with the surface-engaging member, receiving light energy that is reflected by the reflective member, and ascertaining, from the received light energy, a roughness measurement.

Neither Jackson nor Watanabe, alone or in combination, disclose or suggest a print device or a method in which roughness of a medium surface is measured or ascertained by sensing movement of light that has been reflected off of a reflective member associated with a surface-engaging member which moves as a result of variations in the profile or roughness of the surface. In contrast, Jackson merely discloses one embodiment 110a which utilizes a light-emitting diode 120 and a position detector 122 to measure a thickness or a curl of a sheet. Nowhere does Jackson disclose or even suggest that light-emitting diode 120, position detector 122 and sensor arm 112 may alternatively be used to measure surface roughness. In fact, although Jackson discloses no less than 13 different embodiments for measuring paper properties, not one of these embodiments is disclosed for the purpose of measuring surface roughness.

Like Jackson, Watanabe also fails to disclose measuring or otherwise detecting variations in surface roughness by reflecting a light off of a reflective member associated with a surface-engaging member, and detecting movement of the light which occurs in response to movement of a surface-engaging member as a result of variations in surface roughness. In contrast, Watanabe merely discloses a pick-up 11 which is physically connected to a stylus 10, wherein the pick-up 11 converts movement of the stylus 10 into an electrical current that is amplified and processed and is used to adjust ink applied to the paper by thermal head 3. Nowhere does Watanabe disclose or suggest sensing a surface roughness by

reflecting light off of a reflective member associated with a surface-engaging member and detecting movement of the light which corresponds to variations in the profile of the surface.

In rejecting Claims 1-7, the Office Action asserts that:

Modifying the flat end of the sensor utilizing Jackson et al. with a probe tip as shown in Watanabe et al. would have been obvious to one of ordinary skill in the art as a means to more accurately detect the surface texture of the print media as a means of ensuring high grade printing.

However, this assertion seems to overlook the fact that, regardless of the probe tip being utilized, neither Jackson nor Watanabe disclose measuring or detecting a roughness of a surface by sensing movement of light reflected off of a reflective member associated with a surface-engaging member that moves or modulates in response to variations in surface roughness.

Neither Jackson nor Watanabe provide any motivation or suggestion for their modification based upon the teachings of the other. As noted above, Jackson discloses multiple paper property sensors specifically configured to sense particular paper properties. Watanabe merely adds another type of paper property sensor configured for specifically measuring surface roughness. Nowhere does Jackson disclose or suggest that its one embodiment 110a that actually detects light from an LED 120 deflected by sensor arm 112 may be used for anything but sensing sheet thickness and curl. To the best of Applicant's understanding of Watanabe based upon its English abstract, nowhere does Watanabe disclose or suggest that surface roughness may be measured by alternatively sensing movement of light reflected off of a reflector associated with its stylus 10. Since neither Jackson nor Watanabe even recognized that surface roughness may be measured or ascertained by reflecting light off of a reflective member associated with a surface-engaging member, it would not be obvious to one of ordinary skill in the art to modify either Jackson or Watanabe to specifically configure or calibrate position detector 122 of Jackson to be sensitive to the relative small movement of light that occurs in response to variations in surface roughness. Any such assertion to this effect would

appear to be using Applicant's own disclosure as a blueprint and to be based upon impermissible hindsight reasoning.

In response to the aforementioned points, the Office Action once again acknowledges that Jackson fails to disclose using a cantilevered apparatus for specifically detecting roughness of a medium/paper. As a result, the Office Action attempts to additionally rely upon Jackson which merely discloses measuring deflections of a cantilever using a pick up to detect changes in a paper's roughness. The Office Action asserts that:

Modifying the apparatus of Jackson et al., to measure surface roughness with a cantilever and optical deflection techniques would have been obvious to one of ordinary skill in the art because optical beam deflection is a very accurate and well known measuring technique used to determine surface roughness in various media.

However, nowhere does the Office Action cite any support for its assertion that "optical beam deflection is a very accurate and well known measuring technique used to determine surface roughness in various media." The Office Action fails to cite a single analogous art reference that would lead one of ordinary skill in the art to utilize optical beam deflection to sense surface roughness in media such as media in a printer. Thus, the assertion that it would somehow be obvious to modify Jackson, which only discloses optical beam deflection for detecting paper thickness and curvature, to alternatively use optical beam deflection for sensing surface roughness based upon Watanabe which only teaches sensing roughness using pick up attached to a cantilevered arm would appear to be based upon impermissible hindsight reasoning using Applicant's own disclosure as a blueprint. Accordingly, the rejection the Claims 1, 6 and 15 based upon Jackson and Watanabe should be withdrawn.

Paragraph 4 of the Office Action responds to previous arguments by noting that one cannot show non-obviousness by attacking references individually where the rejections are based on combinations of references. However, Applicant respectfully notes that to establish a prima facie case of obviousness under 35

U.S.C. § 103, there must be some suggestion or motivation in the references themselves for the hypothetical modification asserted in the rejection. As noted above, neither Jackson nor Watanabe provide such suggestion or motivation. Moreover, the Office Action has failed to cite any specific support for its assertion that optical beam deflection is a well-known measuring technique known to those of ordinary skill in the art. Accordingly, the rejection of Claims 1, 6, and 15 should be withdrawn. Claims 2-7, 9-11, 13-18 and 19-20 depend from Claims 1, 6 and 15 and are patentably distinct over the prior art of record for the same reasons.

B. Claims 2, 3 and 19.

Claims 2 and 3 depend from Claim 1; Claim 7 depends from Claim 6; and Claim 19 depends from Claim 15. Each of Claims 2, 3, 7 and 19 recite that one or more print parameters are modulated or adjusted based upon the detected roughness of the medium surface. The prior art of record fails to disclose a device or method wherein optical beam deflection is used to detect surface roughness and wherein the detected roughness is further used to adjust or modulate one or more printer parameters. Thus, Claims 2, 3, 7 and 19 are patentably distinct over Jackson and Watanabe for this additional reason.

C. Claims 10, 11, 14 and 20.

Claims 10 and 11 ultimately depend from Claim 1; Claim 14 ultimately depends from Claim 6; and Claim 20 ultimately depends from Claim 15. Each of Claims 10, 11, 14 and 20 specifically recite that the one or more print parameters that are adjusted or modulated based upon the detected surface roughness include fuser temperature, fusing time, fusing speed, toner concentration, toner developer voltage, toner transfer device voltage and photosensitive surface charging device voltage.

As noted in the previous response, neither Jackson, Watanabe nor the prior art disclose or suggest modulating any of such parameters based upon measurement of surface roughness. For example, Watanabe merely discloses a printer that deposits ink upon a medium rather than toner. Watanabe fails to disclose or even recognize the parameters associated with the electrophotographic

printers, such as the claim parameters, may also be beneficially adjusted based upon measured surface roughness. Thus, Claims 10, 11, 14 and 20 are patentable distinct over the prior art of record for this additional reason.

III. Added Claim.

The Office Action objected to Claim 12. In response, Claim 12 is rewritten in independent form as added Claim 21. Consideration and allowance of added Claim 21 are respectfully requested.

IV. Conclusion.

After amending the claims as set forth above, claims 1-17 and 19-21 are now pending in this application.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 08-2025. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 08-2025. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 08-2025.

Respectfully submitted,

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